

CLAIMS

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1. Impact additive of the core/shell type composed of a core based on alkyl or on a polyorganosiloxane rubber and a shell based on poly(alkyl methacrylate), or on a styrene-acrylonitrile copolymer, characterized in that the said impact additive comprises from:

a) 70% to 90% by weight of a crosslinked elastomeric core which is composed:

1) of 20% to 100% by weight, and preferably of 20% to 90%, of a nucleus composed of a copolymer (I) of n-alkyl acrylate, the alkyl group of which has a carbon number ranging from 5 to 12, or of a mixture of alkyl acrylates, the linear or branched alkyl group of which has a carbon number ranging from 2 to 12, or of a polyorganosiloxane rubber, of a polyfunctional crosslinking agent possessing unsaturated groups in its molecule, at least one of which is of $\text{CH}_2=\text{C}$ vinyl type, and optionally of a polyfunctional grafting agent possessing unsaturated groups in its molecule, at least one of which is of $\text{CH}_2=\text{CH}-\text{CH}_2-$ allyl type, the said nucleus containing a molar amount of crosslinking agent and optionally of grafting agent ranging from 0.05% to 5%,

2) of 80% to 0% by weight, and preferably of 80% to 10%, of a covering composed of a copolymer (II) of n-alkyl acrylate, the alkyl group of which has a carbon number ranging from 4 to 12, or of a mixture of alkyl acrylate as defined above in 1) and

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of a grafting agent possessing unsaturated groups in its mol cul , at least one of which is of $\text{CH}_2=\text{CH}-\text{CH}_2$ -allyl type, the said covering containing a molar amount of grafting agent ranging from 0.05 % to 2.5 %, 5

b) 30 % to 10 % by weight of a shell graft d onto the said core composed of a polymer of an alkyl methacrylate, the alkyl group of which has a carbon number ranging from 1 to 4, or alternatively of a 10 statistical copolymer of an alkyl methacrylate, the alkyl group of which has a carbon number ranging from 1 to 4, and of an alkyl acrylate, the alkyl group of which has a carbon number ranging from 1 to 8, containing a molar amount of alkyl acrylate ranging 15 from 5 % to 40 %, or alternatively composed of a styrene-acrylonitrile copolymer.

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2. ^{A composition} ~~Impact additive~~ according to Claim 1, characterized in that the said impact additive comprises from:

20 a) 75 % to 85 % of a crosslinked elastomeric core,

b) 25 % to 15 % of a shell grafted onto the said core.

3. ^{A composition} ~~Impact additive~~ according to ^{Claim 1} ~~either of~~ 25 ~~Claims 1 and 2~~, characterized in that the alkyl group of the n-alkyl acrylate of the copolymer (I) has a carbon number ranging from 5 to 8 and that the alkyl group of th n-alkyl acrylat of the cop lymer (II) has

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a carbon number ranging from 4 to 8.

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4. ^{A composition}
~~Impact additive~~ according to ^{Claim 1}
~~Claims 1 to 3~~, characterized in that the alkyl group of the alkyl acrylates of the mixture forming part of the copolymers (I) and/or (II) has a carbon number ranging from 4 to 8.

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5. ^{A composition}
~~Impact additive~~ according to Claim 1, characterized in that the crosslinking agent is chosen from derivatives possessing at least two double bonds of $\text{CH}_2=\text{C}$ vinyl type.

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6. ^{A composition}
~~Impact additive~~ according to Claim 1, characterized in that the crosslinking agent is chosen from derivatives possessing one or a number of double bonds of vinyl type and at least one double bond of $\text{CH}_2=\text{CH}-\text{CH}_2$ - allyl type.

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7. ^{A composition}
~~Impact additive~~ according to ^{Claim 1}
~~Claims 1 and 5~~, characterized in that the crosslinking agent is 1,4-butanediol diacrylate.

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8. ^{A composition}
~~Impact additive~~ according to ^{Claim 1}
~~Claims 1 and 6~~, characterized in that the crosslinking agent is allyl acrylate or methacrylate.

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9. ^{A composition}
~~Impact additive~~ according to Claim 1, characterized in that the grafting agent is chosen from derivatives possessing at least two double bonds of $\text{CH}_2=\text{CH}-\text{CH}_2$ - allyl type.

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10. ^{A composition}
~~Impact additive~~ according to Claim 1, characterized in that the grafting agent is chosen from derivatives possessing one or a number of double bonds

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of allyl type and at least one double bond of vinyl type.

B 11. ^{A composition} ~~Impact additive according to either of~~ ^{Claim 1}
~~Claims 1 and 9~~, characterized in that the grafting
 5 agent is diallyl maleate.

B 12. ^{A composition} ~~Impact additive according to either of~~ ^{Claim 1}
~~Claims 1 and 10~~, characterized in that the grafting
 B agent is allyl acrylate or methacrylate.

B 13. ^{A composition} ~~Impact additive according to one of~~ ^{Claim 1}
 B 10 ~~Claims 1 to 12~~, characterized in that the nucleus of
 the crosslinked core has a molar amount of crosslinking
 agent and optionally of grafting agent of between 0.5 %
 and 1.5 %.

B 14. ^{A composition} ~~Impact additive according to one of~~ ^{Claim 1}
 B 15 ~~Claims 1 to 4 and 10 to 12~~, characterized in that the
 covering of the crosslinked core has a molar amount of
 grafting agent of between 0.5 % and 1.5 %.

B 15. ^{A composition} ~~Impact additive according to one of~~ ^{Claim 1}
~~Claims 1 to 4~~, characterized in that the statistical
 B 20 copolymer of the shell has a molar amount of alkyl
 acrylate of between 10 % and 20 %.

B 16. ^{A composition} ~~Impact additive according to either of~~ ^{Claim 1}
 B ~~Claims 1 and 3~~, characterized in that the n-alkyl
 acrylates used to form the copolymer (I) are n-pentyl
 25 acrylate, n-hexyl acrylate, n-heptyl acrylate and
 n-octyl acrylate.

B 17. ^{A composition} ~~Impact additive according to one of~~ ^{Claim 1}
 B ~~Claims 1 to 3~~, characterized in that the n-alkyl

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acrylates used to form the copolymer (II) are n-butyl acrylate, n-pentyl acrylate, n-hexyl acrylate, n-heptyl acrylate and n-octyl acrylate.

B 18. ^{A composition}
~~Impact additive~~ according to Claims 16
 B 5 ~~and 17~~, characterized in that the n-alkyl acrylate for forming the copolymers (I) and (II) is n-pentyl acrylate.

B 19. ^{A composition}
~~Impact additive~~ according to Claims 16
 B ~~and 17~~, characterized in that the n-alkyl acrylate for
 10 forming the copolymers (I) and (II) is n-hexyl acrylate.

B 20. ^{A composition}
~~Impact additive~~ according to Claims 16
 B ~~and 17~~, characterized in that the n-alkyl acrylate for forming the copolymers (I) and (II) is n-heptyl
 15 acrylate.

B 21. ^{A composition}
~~Impact additive~~ according to Claims 16
 B ~~and 17~~, characterized in that the n-alkyl acrylate for forming the copolymers (I) and (II) is n-octyl acrylate.

B 22. ^{A composition}
~~Impact additive~~ according to Claims 16
 B ~~and 17~~, characterized in that the n-alkyl acrylate for forming the copolymer (I) is n-octyl acrylate and that the n-alkyl acrylate for forming the copolymer (II) is n-butyl acrylate.

B 23. ^{Claim 1}
~~Impact additive~~ according to ~~one of~~
 B ~~Claims 1 to 3~~, characterized in that the linear or branched alkyl acrylates constituting the mixture of alkyl acrylates used for forming the copolymers (I)

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and/or (II) are ethyl acrylate, n-propyl acrylate, n-butyl acrylate, amyl acrylate, 2-methylbutyl acrylate, 2-ethylhexyl acrylate, n-hexyl acrylate, n-octyl acrylate, n-decyl acrylate, n-dodecyl acrylate and 3,5,5-trimethylhexyl acrylate.

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24. ^{A composition}
~~Impact additive~~ according to Claim 23, characterized in that use is made of an amount by weight of n-alkyl acrylate at least equal to 10 % by weight of the mixture of alkyl acrylates.

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25. ^{A composition}
~~Impact additive~~ according to Claim 24, characterized in that use is made of an amount by weight of n-alkyl acrylate of between 20 % and 80 % by weight of the mixture of alkyl acrylates.

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26. ^{A composition}
~~Impact additive~~ according to ^{Claim 23}~~one of~~

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15 ~~Claims 23 to 25~~, characterized in that the n-alkyl acrylate is n-octyl acrylate.

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27. ^{A composition}
~~Impact additive~~ according to Claim 1 or 2, characterized in that the alkyl methacrylate used to form the shell is methyl methacrylate.

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28. Thermoplastic polymer composition containing an impact additive according to any one of Claims 1 to 27.

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29. Composition according to Claim 28, characterized in that the thermoplastic polymer is composed of one or a number of polymers of the polycondensate type, in particular polyesters, such as poly(butylene terephthalate), polyamides, polyesteretheramides, polycarbonates and alloys of the

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abovementioned polymers.

30. Composition according to Claim 28, characterized in that the thermoplastic polymer is composed of one or a number of polymers chosen from the group formed by poly(alkyl methacrylate)s and in particular poly(methyl methacrylate); optionally superchlorinated vinyl chloride homopolymers; the copolymers which result from the copolymerization of vinyl chloride with one or a number of ethylenically unsaturated comonomers and which contain at least 80 % by weight of polymerized vinyl chloride; 1,1-dichloroethylene homopolymer; or 1,1-difluoroethylene homopolymer.

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31. ^{A composition}
~~Composition~~ according to Claim 30, characterized in that the thermoplastic polymer is a vinyl chloride homopolymer.

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32. ^{A composition}
~~Composition~~ according to Claim 29, characterized in that the thermoplastic polymer is a poly(butylene terephthalate).

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33. ^{A composition}
~~Composition~~ according to ^{Claim 28}
~~one of Claims~~
~~28 to 32~~, characterized in that the content of impact additive is between 1 part and 30 parts by weight per 100 parts by weight of the thermoplastic polymer used.

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34. ^{A composition}
~~Composition~~ according to Claim 33, characterized in that the content of impact additive is between 5 parts and 10 parts by weight per 100 parts by weight of the thermoplastic polymer used.

35. Process for producing an impact additive

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according to claim 1 comprises the preparation, in a first stage, of a crosslinked elastomeric core composed of a nucleus and of a covering and then, in a second stage, the grafting onto the said crosslinked elastomeric core of a shell made of poly(alkyl methacrylate).

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36. ^{A composition}
~~Composition~~ according to claim 30,

characterized in that the thermoplastic polymer is a 1,1-trifluoroethylene homopolymer.

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37. ^{Composition}
An ~~impact additive~~ according to claim 1,

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wherein the core contains above 0 to 80% by weight of said covering.

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38. ^{Composition}
An ~~impact additive~~ according to claim 37, wherein the covering constitutes at least 5% by weight of said core.

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39. ^{Composition}
An ~~impact additive~~ according to claim 37, wherein the covering constitutes at least 10% by weight of said core.

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40. ^{A composition}
~~An impact additive~~ according to claim 1, wherein the core does not contain a covering.

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